AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1.   (Currently Amended) An initial synchronization searching method of a mobile communication system, the method comprising:

selecting a region for an initial synchronization from an input signal; and

obtaining an initial synchronization by correlating the selected region and a synchronous code, wherein obtaining the initial synchronization includes:

obtaining a correlation value of each candidate region, and

judging that synchronization has been obtained in a corresponding candidate region if a specific correlation value is greater than a threshold value.

2.   (Currently Amended) The method of claim 1, wherein selecting the region comprises:

respectively accumulating input signals of a channel I and a channel Q and obtaining two absolute values for each the channel I and the channel Q;

adding the two absolute values; and

estimating a region as a candidate region, the estimated region having a high power distribution in a power distribution of the added absolute values.

3.   (Original) The method of claim 2, wherein the accumulating is performed by a circulation buffer.

4.   (Currently Amended) The method of claim 2, wherein the estimating comprises:

searching the region with the high power distribution from the added absolute values ~~of the input signal~~;

checking whether a length of the region corresponds to a search range; and

estimating the region as the candidate region if the length of the region with the high power distribution corresponds to the search range.

5.   (Previously Presented) The method of claim 4, wherein the search range comprises 64 chips.

6.   (Previously Presented) The method of claim 2, wherein the input signal is accumulated according to the following equation:

$$\sum I(t\%L) = \sum Q(t\%L)$$

wherein 't' is an input sequence number, 'L' is a size of the accumulation buffer, and % indicates a remaining operator.

7.   (Canceled)

8.   (Currently Amended) An initial synchronization method of a mobile communication system comprising:

respectively accumulating I and Q signals and obtaining two absolute values for ~~each~~the I and Q signals;

adding the two absolute values;

estimating a candidate region from a power distribution of the added absolute values; and

correlating the estimated candidate region with a synchronous code to obtain initial synchronization of a terminal, wherein the initial synchronization includes:

obtaining a correlation value by correlating the candidate region and a synchronous code, and

judging that synchronization has been obtained at the corresponding candidate region if the specific correlation value is greater than a threshold value.

9.   (Previously Presented) The method of claim 8, wherein the estimating comprises:

searching for a region with a high power distribution from the absolute value of one frame;

checking whether a length of the region with the high power distribution corresponds to a search range; and

estimating a corresponding region as the candidate region if the length of the region with the high power distribution corresponds to the search range.

10.   (Previously Presented) The method of claim 9, wherein the search range comprises 64 chips.

11.   (Canceled)

12.   (Previously Presented) An apparatus in a mobile communication system comprising:

first and second accumulation buffers to respectively accumulate I and Q signals;

first and second absolute value calculators to obtain an absolute value from outputs of the first and second accumulation buffers;

an adder to add outputs of the first and second absolute value calculators;

an estimator to estimate a candidate region for initial synchronization from the added absolute values; and

a synchronization searching unit to obtain an initial synchronization of a terminal by correlating the estimated candidate region and a synchronous code.

13.   (Currently Amended) The apparatus of claim 12, wherein each of the first and second accumulation buffers comprises a circulation buffer.

14.   (Currently Amended) The apparatus of claim 12, wherein the estimator is configured to search a region having a high power distribution from an absolute value of one frame and to estimate a region with a length of a power distribution corresponding to a search range as a candidate region.

15.   (Previously Presented) The apparatus of claim 14, wherein the search range comprises 64 chips.

16.   (Original) The apparatus of claim 12, wherein the synchronization searching unit is configured to obtain a correlation value by correlating the candidate region and a synchronous code, and if a correlation value is greater than a threshold value, the synchronization searching unit is configured to judge that synchronization has been obtained in the corresponding candidate region.

17.   (Previously Presented) The apparatus of claim 12, wherein the apparatus comprises a base station.

18.   (Previously Presented) The apparatus of claim 12, wherein the apparatus comprises a mobile terminal.

19.   (Original) The apparatus of claim 12, wherein the apparatus comprises at least one base station and at least one mobile terminal.

20.   (Original) The apparatus of claim 12, wherein the communication system is at least one of a Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) communication system and a Universal Mobile Telecommunications System-Time division Duplexing (UMTS-TDD) communication system.

21.   (Currently Amended) An apparatus comprising:

an estimator configured to select a region from an input signal, wherein the input signal comprises a combined value of I and Q signals;

a synchronizer configured to determine an initial synchronization from the region by correlating the selected region to a synchronization code, wherein the initial synchronization is determined by:

obtaining a correlation value by correlating the candidate region and a synchronous code, and

judging that synchronization has been obtained at the corresponding candidate region if the specific correlation value is greater than a threshold value.

22.   (Currently Amended) The apparatus of claim 21, further comprising:

accumulation buffers and absolute value calculators configured to receive the I and Q signals and to generate absolute values for each signal of the I and Q signals; and

an adder configured to add the absolute values of the I and Q signals to generate the combined value of the I and Q signals and to convey the combined value to the estimator.

23.   (Previously Presented) The apparatus of claim 22, wherein the accumulation buffers comprise circular buffers.

24.   (Original) The apparatus of claim 23, wherein the accumulation buffers are configured to accumulate a plurality of oversampled I and Q signals, respectively.

25.   (Original) The apparatus of claim 21, wherein the estimator is configured to select the region by searching the input signal and selecting a region that has a relatively high power distribution in comparison to the remaining input signal.

26.   (Previously Presented) The apparatus of claim 25, wherein the estimator is configured to select the region by comparing a length of the region to a search range.

27.   (Previously Presented) The apparatus of claim 26, wherein the search range comprises 64 bits.

28.   (Original) The apparatus of claim 21, wherein the apparatus is at least one of a base station and a mobile terminal.

29.   (Previously Presented) The apparatus of claim 21, wherein the apparatus comprises a mobile communication system.

30. (Original) The apparatus of claim 29, wherein the mobile communication system is at least one of a Time Division-Synchronous Code Division Multiple Access (TD-SCDMA) communication system and a Universal Mobile Telecommunications System-Time division Duplexing (UMTS-TDD) communication system.